

## CLAIMS

### 1. A light illuminating apparatus comprising

first radiating means of an optical structure having one or more light separating surface for transmitting and reflecting a light beam for splitting the light beam into a transmitted light beam and a reflected light beam, said first radiating means routing a sole light beam incident thereon through said one or more light separating surface to generate  $n$  light beams, where  $n$  is a natural number not less than two;

second radiating means of the same optical structure as said first radiating means, said second radiating means routing a sole light beam incident thereon through said one or more light separating surface to generate  $n$  light beams; and

light synthesizing means for synthesizing one light beam each of said  $n$  light beams radiated by said first radiating means so as to be incident on the light synthesizing means, and one light beam each of said  $n$  light beams radiated by said second radiating means so as to be incident on the light synthesizing means, to generate  $n$  light beams;

said light synthesizing means synthesizing an  $m$ 'th light beam, generated by said first radiating means, and an  $(n-m+1)$ st light beam, generated by said second radiating means, on one and the same axis, provided that the  $n$  light beams generated by said first radiating means and the  $n$  light beams generated by said